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Strategic Analysis Report
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Hype Cycle for Healthcare Provider Technologies, 2004

The art of medicine has exceeded the cognitive capacity of people. It needs the help of the technologies tracked in our Hype Cycle to improve decisions and collaboration. At last, public policy is coming around to support this opportunity.

Management Summary

2004 is a pivotal year for healthcare IT around the world. Policymakers are increasingly giving attention and money to the proposition that cost, quality and patient safety cannot be improved without significantly expanding the use of IT. Technology is required to support the individual caregiver and the multiprovider collaboration that is fundamental to healthcare. At the same time, improved computer hardware and software capabilities are engaging providers in ways that facilitate individual and group care delivery.

Together, these elements will lead to more software purchases and wider implementations of Generation 3 computer-based patient record (CPR) systems (see "The 2004 Gartner Computer-Based Patient Record System Generation Model," R-21-6592). For the selected CPR systems to rise to Generation 3, vendors will have to incorporate the best implementations from several new technologies. Many of the technologies will make CPR systems more facile for the caregiver or improve the quality of the data that the CPR collects. These include handwriting recognition, continuous speech recognition, natural language processing, personal digital assistants (PDAs), tablet computers and standard controlled medical vocabularies.

Other technologies will improve the quality of collaboration among caregivers and their systems for clinical and administrative facets of care. These include document imaging systems, rule engines, workflow, the continuity of care record, the Health Level 7 (HL7) Clinical Document Architecture (CDA), Version 3 messaging standards, service-oriented business applications (SOBAs), Web Services and direct electronic data interchange (EDI).

Finally, some healthcare IT technologies promise to reduce the administrative overhead and caregiver impact of meeting security requirements. We track public-key infrastructure (PKI), secure e-mail and HL7 Context Management technologies in this year's Healthcare Provider Hype Cycle.

Care delivery organizations must evaluate CPR products with a critical view of how and when they employ these new technologies. Gartner's Hype Cycle helps you assess the technology contents of these products.

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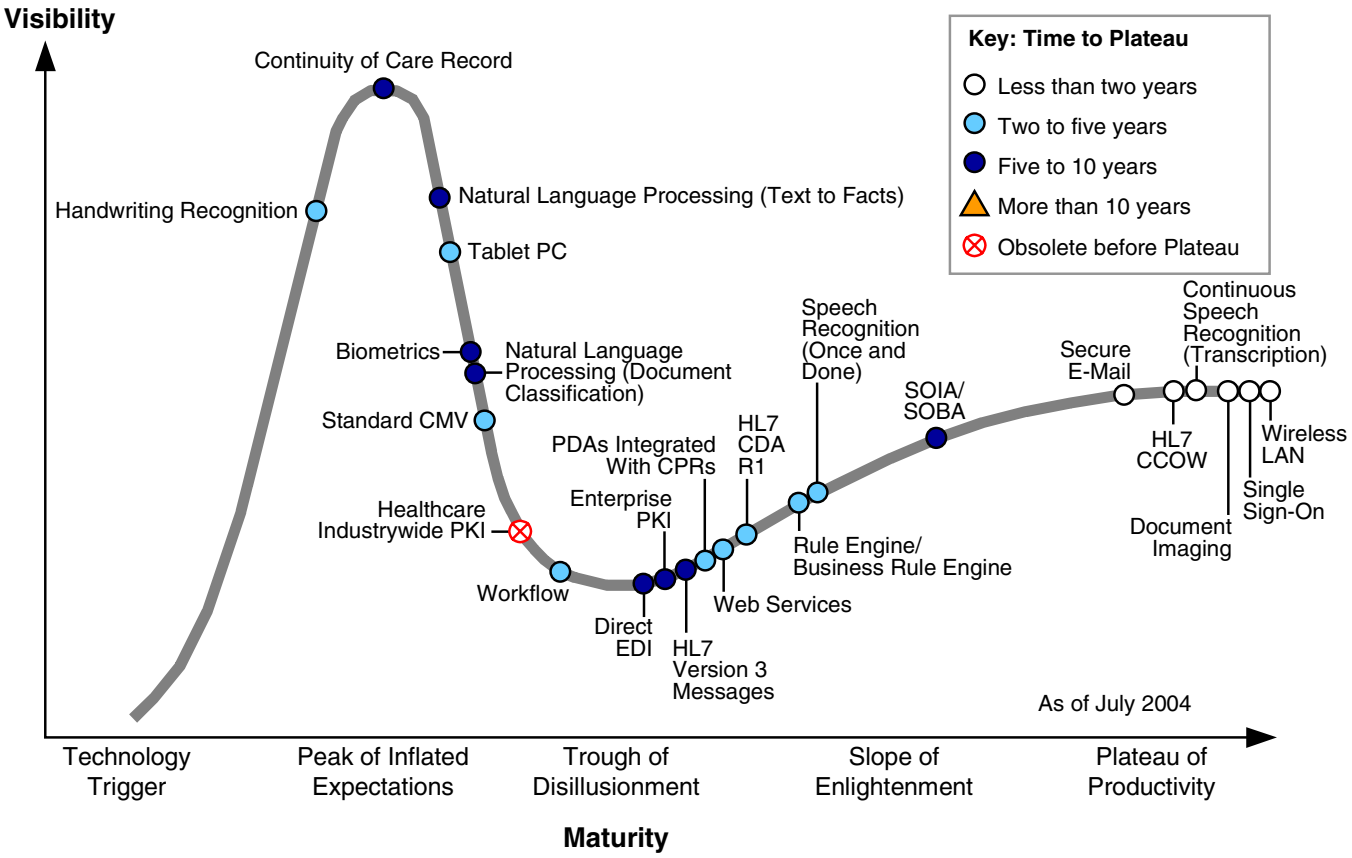
1.0 Hype Cycle for Healthcare Provider Technologies, 2004



Acronym Key

CCOW	clinical context object workgroup	**PDA**	personal digital assistant
CDA	clinical document architecture	**PKI**	public-key infrastructure
CMV	controlled medical vocabulary	**R1**	release 1
CPR	computer-based patient record	**SOBA**	service-oriented business application
EDI	electronic data interchange	**SOIA**	service-oriented integration architecture
HL7	Health Level Seven		

Source: Gartner Research (July 2004)

Figure 1. Hype Cycle for Healthcare Provider Technologies, 2004

At last, policymakers are asking more of healthcare IT. Around the world, healthcare costs continue to rise; population health worsens; and the healthcare industry, the public and healthcare sponsors are more aware of quality and patient safety issues. Increasingly, those that control the funding recognize that these problems cannot be solved without the assistance of IT systems. Healthcare depends on the clinical decision-making capacity and reliability of autonomous individual practitioners for classes of problems that routinely exceed the bounds of unaided human cognition. Patient care doesn't stop with the individual practitioner. It is highly collaborative, and many obstacles to quality and efficiency arise not from the actions of any individual, but from the coordination within and among the overall processes giving care and arranging for care and payment.

Two important elements provide some hope for the future:

- Policymakers are recognizing that having more computer-facilitated healthcare requires public programs to remove obstacles, promulgate standards, fund investments and, in the United States, ameliorate a system of incentives that currently works against progress.
- Computer hardware and software are improving their capability to engage healthcare providers in ways that facilitate individual and group care delivery.

Taken together, these elements lead Gartner to expect that care delivery organizations will select more CPR systems that meet our criteria for Generation 3 (that is, they facilitate care-giver decision making and collaboration). For CPR products to fully meet our criteria, vendors will have to incorporate many of the new technologies tracked in this year's Hype Cycle. Healthcare provider organizations should evaluate new products and a vendor's vision based on their Hype Cycle position and the direction of emerging technologies:

- *The technologies that have the most-profound impact on healthcare will traverse the life cycle gradually.* The combination of handwriting recognition, speech recognition, natural language processing and controlled medical vocabularies promise to break the CPR input barrier, giving them the structured data that will enable them to aid human cognition and group collaboration. However, each of these technologies has rate-limiting confining factors that control adoption. Early successes with less-profound applications pave the way for longer-term results. Examples of this include natural language process for document classification and continuous speech recognition to improve transcription.
- *CPR vendors that reduce the requirement for specialized analysts to configure their software will have the most-profound impact on healthcare.* New technologies such as workflow and rule engines can be most easily developed by defining complex textual configuration files that can only be set up by analysts interpreting input from users. The incremental investment to create user interfaces by which users can directly create and amend workflows and rules will make implementations go faster and generate post-implementation improvements in the way CPR systems are used.

2.0 At the Peak

2.1 Handwriting Recognition

Handwriting recognition of lettered and cursive input will add a natural form of input to CPR systems that accompany dictation. This technology has long been hyped, but slow to develop for practical use in CPR systems.

Definition: Conversion of free-form hand printing and cursive writing into ASCII text.

Justification for Hype Cycle Position/Adoption Speed: Basic recognition is quite good. Contextual awareness will improve recognition for healthcare applications. This and other usability enhancements will be included in Windows XP Tablet PC Edition 2005, which will be included in Windows XP SP2. Microsoft expects to release SP2 in 3Q04.

Business Impact Areas: Usability of CPR systems by physicians, breaking the physician "input bottleneck" in CPRs and accelerating the adoption rate for tablet computers in clinical healthcare.

Benefit Rating: Moderate.

Market Penetration: Less than 1 percent of target audience.

Maturity: Embryonic.

Selected Vendors: Anoto Pen, Microsoft and Parascript.

Analysis by Jim Klein

2.2 Continuity of Care Record

Definition: The continuity of care record (CCR) is a subset of a patient's medical record that can be exchanged between two medical entities as a standard set of clinical information. ASTM International worked with physician groups to develop this standard quickly as a collection of text blocks. It is achieving the widespread recognition associated with the peak of the cycle and is likely to achieve acceptance as fast as any new technology in healthcare. Its simplicity will assist early adoption. As CPR systems begin to produce and consume CCR documents, users will recognize the need for coded information and consistency with HL7 standards. Harmonization with HL7 will begin in 2004.

Justification for Hype Cycle Position/Adoption Speed: The CCR standard for uncoded data has recently been released but there is no implementation standard or full implementations at this time.

Business Impact Areas: Exchange summary data, planned extensions for chronic disease management, and other uses.

Benefit Rating: Moderate.

Market Penetration: Less than 1 percent of target audience.

Maturity: Embryonic.

Selected Vendors: ASTM International.

Analysis by Barry R. Hieb, M.D.

2.3 Natural Language Processing (Text to Facts)

Definition: The ability to turn text into encoded, structured information based on an appropriate ontology.

Natural language processing has two entries in the Hype Cycle. The more-challenging application — text to facts — involves converting dictated, scanned or other text into structured facts for use in decision support and other computer algorithms. The technology is strong but not yet validated by widely accepted studies. Its acceptance is hampered by the lack of standard ontologies. Gartner foresees quicker adoption for natural language processing applications such as document classification and summarization. These applications can tolerate a higher error rate than "text to facts" and will be more easily accepted.

Justification for Hype Cycle Position/Adoption Speed: Natural language processing is ready but the lack of standard ontologies of sufficient power to encode the complexity of modern medical practice will impede adoption.

Business Impact Areas: Extraction of facts from textual reports for decision support and clinical research.

Benefit Rating: High.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: A-Life Medical, and Language and Computing.

Analysis by Barry R. Hieb, M.D.

3.0 Sliding Into the Trough

3.1 Tablet PC

Definition: Tablet computers that run Microsoft Windows XP Tablet PC Edition. Supports digital ink, handwriting recognition and speech recognition.

Justification for Hype Cycle Position/Adoption Speed: Tablet computers work well for general computer users. They are a natural for the point of care, but successful widespread deployment in CPR depends on reduced cost, adaptation by CPR software vendors and improvements in handwriting recognition, which are beginning to appear.

Business Impact Areas: Inpatient and ambulatory CPR systems at the point of care, and accelerated adoption rates of CPR systems by physicians.

Benefit Rating: Moderate.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: Acer, HP, Motion Computing, NEC, Toshiba and ViewSonic.

Analysis by Jim Klein

3.2 Biometrics

Definition: The use of an element of "what you are" as a form of identification and authentication. Includes finger or hand scans, handwriting on a tablet, keyboard ballistics, iris scans, facial recognition and other systems.

Justification for Hype Cycle Position/Adoption Speed: False acquisition and false acceptance rates remain too high for broad-based usage. Several recent, large sales, in conjunction with single sign-on (SSO), have renewed interest in fingerprint scanning. The Health Insurance Portability and Accountability Act (HIPAA) security regulation does not require biometrics but is helping to drive renewed interest.

Business Impact Areas: Authentication and user convenience.

Benefit Rating: Low.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: ActivCard, BNX Systems, Daon, Identix and Keyware Technologies.

Analysis by Jim Klein

3.3 Natural Language Processing (Document Classification)

Definition: The ability to classify text documents — for example, transcribe doctor's notes, observations and plans, and research articles into medical journals for concept-based retrieval.

Justification for Hype Cycle Position/Adoption Speed: This technology is being deployed for classifying and searching medical research literature. It's only in an academic pilot for use with medical notes.

Business Impact Areas: Knowledge management, medical records management, and post-discharge coding and abstracting.

Benefit Rating: Moderate.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: A-Life Medical, Dictaphone, and Language and Computing.

Analysis by Barry R. Hieb, M.D.

3.4 Standard CMV

Definition: Standard controlled medical vocabulary (CMV) — particularly coding schemes for medical concepts as de jure or de facto standards — are needed for information interchange among CPR systems and to accelerate CPR implementations.

Justification for Hype Cycle Position/Adoption Speed: At last, the U.S. and U.K. governments have concluded negotiations with the College of American Pathologists for widespread free use of Systemized Nomenclature of Human and Veterinary Medicine-Clinical Terminology (SNOMED-CT). This will form the core of a national CMV. The U.S. Federal Consolidated Healthcare Informatics initiative has identified or created coding systems for other important concept sets, including RxNORM for pharmaceuticals.

Business Impact Areas: CPR system interoperability and clinical decision support.

Benefit Rating: High.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Emerging.

Selected Vendors: 3M, Apelon, Cerner, College of American Pathologists, Health Language, Medicomp Systems and National Library of Medicine.

Analysis by Barry R. Hieb, M.D.

3.5 Healthcare Industrywide PKI

Definition: The emergence of an interoperable network of certificate authorities that results in widespread acceptance of one or two digital certificates easily obtainable by physicians to authenticate identity and implement digital signatures.

Justification for Hype Cycle Position/Adoption Speed: Several national and regional efforts have been notably unsuccessful. The best hope for the healthcare industry would be to "piggy back" on the U.S. Drug Enforcement Agency's digital certificate/cryptographic smart card initiative. PKI has made better progress in companies.

Business Impact Areas: Interenterprise information access, interoperability and Web services.

Benefit Rating: High.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: American Medical Association and MEDePass.

Analysis by Jim Klein

3.6 Workflow

Definition: The use of workflow engines that support explicit clinical workflow design by workers using graphical design tools. Workflow is a well-established technology that coordinates people's interactions with each other and with computer systems. It is necessary in CPR systems to enable high-quality collaboration that will make healthcare safer and more efficient.

Justification for Hype Cycle Position/Adoption Speed: In the context of a CPR system, Gartner positions it near the trough because the next-generation CPR systems that use it are only beginning to roll out. Products vary in the degree to which they provide graphical tools that permit users who are not trained computer analysts to design and amend workflows. This difference will affect the success of workflow capabilities within CPR systems.

Business Impact Areas: Application integration, acute care CPRs, e-health, supply chain and revenue cycle management.

Benefit Rating: High.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Adolescent.

Selected Vendors: Insession Technologies, SeeBeyond and Siemens/Staffware.

Analysis by Barry R. Hieb, M.D.

3.7 Direct EDI

Definition: Direct linkage for claims, eligibility and preauthorization EDI transactions between payers and providers for claims and eligibility information that eliminates the clearinghouses.

Justification for Hype Cycle Position/Adoption Speed: Some large providers have direct claims or eligibility linkage to one or two payers. Beyond these levels, the complexity of supporting EDI will delay progress.

Business Impact Areas: Improved revenue cycle management.

Benefit Rating: Moderate.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Emerging.

Selected Vendors: HealthTrio, patient accounting vendors, RealMed and The SSI Group.

Analysis by Wes Rishel

3.8 Enterprise PKI

Definition: The use of PKI within a single company under the scope of one certificate authority to authenticate employees, support encryption and (optionally) support digital signatures.

Justification for Hype Cycle Position/Adoption Speed: Adoption will be principally in the background and used in conjunction with biometrics and smart card authentication.

Business Impact Areas: Authentication, encryption and digital signatures of electronic documents.

Benefit Rating: Moderate.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: Baltimore Technologies, Entrust, Microsoft, RSA Security and VeriSign.

Analysis by Jim Klein

3.9 HL7 Version 3 Messages

Definition: This "new generation" of application integration messaging standard for healthcare is built on a formal development methodology and a reference data model, and removes substantial ambiguity from previous versions.

Justification for Hype Cycle Position/Adoption Speed: In some countries, success of 2.x versions limits version 3.0 to new projects. NHS and other overseas efforts are accelerators.

Business Impact Areas: Application integration, and regional and national clinical data repositories.

Benefit Rating: Moderate.

Market Penetration: Less than 1 percent of target audience.

Maturity: Emerging.

Selected Vendors: Oracle and all vendors qualified for NHS.

Analysis by Jim Klein

3.10 PDAs Integrated With CPRs

Definition: PDAs that provide significant clinical data viewing and real-time updates of a company's CPRs, including but not limited to physician order entry.

Justification for Hype Cycle Position/Adoption Speed: Vendors have products with wireless PDA options appropriate to their strengths. Adoption is limited mainly by the adoption of CPR products.

Business Impact Areas: Information access at point of care, quality of care improvement, closed-loop medication management, physician convenience, clinical workflow execution and the real-time enterprise (RTE).

Benefit Rating: Moderate.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Emerging.

Selected Vendors: Allscripts, Cerner, Eclipsys, Epic, Patient Keeper, Siemens.

Analysis by Jim Klein

3.11 Web Services

Definition: Extensible markup language (XML)-based technology for deploying service-oriented architecture across the Internet.

Justification for Hype Cycle Position/Adoption Speed: Intraenterprise adoption is proceeding at a steady pace. Interenterprise deployment awaits advances in security standards.

Business Impact Areas: Collaboration across the healthcare treatment value chain.

Benefit Rating: High.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Adolescent.

Selected Vendors: Microsoft and application vendors using Java 2 Platform, Enterprise Edition (J2EE) or .NET.

Analysis by Wes Rishel

4.0 Climbing the Slope

4.1 HL7 CDA R1

Definition: The HL7 CDA gives standard XML representations for textual clinical documents. Release 1 (R1) is planned as a basis for HIPAA claims attachments and preauthorization in the United States. HL7 Canada is working on a specification for claims attachments based on CDA Release 2 (R2), even though R2 has not completed the HL7 standardization process.

Justification for Hype Cycle Position/Adoption Speed: Limited implementation in commercial healthcare IT products in the United States. Adoption is proceeding more rapidly in Europe.

Business Impact Areas: CPR systems and personal health records.

Benefit Rating: High.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Adolescent.

Selected Vendors: Dictaphone, MedQuist and VertiSoft.

Analysis by Wes Rishel

4.2 Rule Engine/Business Rule Engine

Definition: The inclusion of a rule engine that supports maintaining complex rule sets designed by end – users and acquired from external knowledge sources. Rule engines are critical to extending CPR systems beyond the capabilities of human cognition and enhancing collaboration.

Justification for Hype Cycle Position/Adoption Speed: The major vendors of third-generation CPR systems have rule engines, but they vary in the usability by nonanalysts. Furthermore, the lack of standardized rule formats, ontologies and vocabularies will impede the sharing of rules, slowing down user rollout.

Business Impact Areas: Clinical decision support systems, automated clinical protocol implementation and output filtering for protected health information.

Benefit Rating: High.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Adolescent.

Selected Vendors: Cerner, Eclipsys, Epic Systems, McKesson, Misys, Pegasys and Siemens.

Analysis by Barry R. Hieb, M.D.

4.3 Speech Recognition (Once and Done)

Definition: Workstation-based continuous speech recognition where the speaker completes the editing necessary for final document production.

Justification for Hype Cycle Position/Adoption Speed: Radiology and pathology adoption is increasing rapidly. For other specialties, the specific language modules generally have not been developed.

Business Impact Areas: RTE, quality of care improvements, elapsed-time reduction and cost reduction.

Benefit Rating: Moderate.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Emerging.

Selected Vendors: Dictaphone, IBM and Talk Technology.

Analysis by Barry R. Hieb, M.D.

4.4 SOIA/SOBA

Definition: SOBAs occur when vendors offer clients the same service-oriented architectures that the vendors' developers use. Clients use this feature to support tighter integration with portals and other applications. In healthcare, Gartner previously called this technology service-oriented integration architectures (SOIAs).

Justification for Hype Cycle Position/Adoption Speed: Vendors converting to .NET and J2EE-based Web services will accelerate the adoption of this technology.

Business Impact Areas: Composite applications, application extension and customization, healthcare treatment and payment value chain, and RTE.

Benefit Rating: High.

Market Penetration: One percent to 5 percent of target audience.

Maturity: Emerging.

Selected Vendors: Cerner, Eclipsys and IDX.

Analysis by Wes Rishel

5.0 Entering the Plateau

5.1 Secure E-Mail

Definition: Systems for encrypting e-mail that do not assume that recipients have digital certificates or anything installed on their PC other than a standard browser.

Justification for Hype Cycle Position/Adoption Speed: Compliance with the HIPAA security standards (mandatory by April 2005) does not absolutely require this for Internet-based e-mail, but are nonetheless accelerating adoption.

Business Impact Areas: Application integration, e-health, RTE and quality of care improvements.

Benefit Rating: High.

Market Penetration: Five percent to 20 percent of target audience.

Maturity: Adolescent.

Selected Vendors: Authentica, Kryptiq, MyDoctorOnline, PostX, ReachMyDoctor, RelayHealth, Siemens, Sigaba, Tumbleweed and ZixCorp.

Analysis by Jim Klein

5.2 HL7 CCOW

Definition: The HL7 Context Management standard is better known by the acronym "CCOW" (created by the clinical context object workgroup). It is a standard that allows autonomous, graphical user interface applications to tune to the same patient and user (enabling and complementing SSO).

Justification for Hype Cycle Position/Adoption Speed: Adoption has reached the early mainstream. Type B organizations (moderate technology adopters that implement new technologies once they have been proven useful and have entered the mainstream) do not appear to be having any difficulty implementing this technology.

Business Impact Areas: Productivity of clinical users, acceptance of automation by physicians and error reduction.

Benefit Rating: Moderate.

Market Penetration: Five percent to 20 percent of target audience.

Maturity: Early mainstream.

Selected Vendors: Carefx, Orion Systems and Sentillion.

Analysis by Jim Klein

5.3 Continuous Speech Recognition (Transcription)

Definition: Continuous speech recognition on voice files captured via the telephone as a preprocessing step before a transcriptionist edits the document. This approach does not require the physician to change his or her workflow.

Justification for Hype Cycle Position/Adoption Speed: Early adopters have seen productivity increases of 35 percent. We expect rapid adoption by Type B organizations.

Business Impact Areas: Transcription of medical documents.

Benefit Rating: Moderate.

Market Penetration: Five percent to 20 percent of target audience.

Maturity: Adolescent.

Selected Vendors: Dictaphone, eScription and Medquist.

Analysis by Barry R. Hieb, M.D.

5.4 Document Imaging

Definition: Document imaging systems that scan paper documents, share the images and manage workflows around them.

Justification for Hype Cycle Position/Adoption Speed: A well-proven solution for sharing and archiving medical record and financial documents. Gartner keeps document imaging systems on the Hype Cycle because reports of their demise are greatly exaggerated. Some prior-generation CPR systems were primarily document-imaging systems, and we criticized them for lacking structured data. Successful third-generation CPR systems must continue to support this technology and integrate it within workflows that create and rely on more-structured data for decision support and knowledge building.

Business Impact Areas: Archiving medical and financial records.

Benefit Rating: High.

Market Penetration: Twenty percent to 50 percent of target audience.

Maturity: Early mainstream.

Selected Vendors: AMS, Cerner, Eclipsys, IDX, LanVision, McKesson, MedPlus, Optio, QuadraMed, Siemens, SolCom and TOWER Technology.

Analysis by Jim Klein

5.5 Single Sign-On

Definition: SSO enables a user to log on once and access a set of disparate applications without additional authentication.

Justification for Hype Cycle Position/Adoption Speed: About 25 percent of healthcare providers have implemented SSO. HIPAA security, biometrics and CCOW are accelerating adoption.

Business Impact Areas: Productivity of clinical users; acceptance of automation by physicians.

Benefit Rating: Moderate.

Market Penetration: Twenty percent to 50 percent of target audience.

Maturity: Early mainstream.

Selected Vendors: Computer Associates, IBM, it_SEC, Netegrity, Novell, PassGo, Passlogix, Procom and Sentillion.

Analysis by Jim Klein

5.6 Wireless LAN

Definition: Wireless connections for local area networks.

Justification for Hype Cycle Position/Adoption Speed: Two-thirds of hospitals have at least one wireless LAN. As security standards stabilize, wireless LANs will become ubiquitous in large healthcare delivery organizations.

Business Impact Areas: Information access at point of care, quality of care improvement, closed loop medication management and RTE.

Benefit Rating: High.

Market Penetration: Twenty percent to 50 percent of target audience.

Maturity: Early mainstream.

Selected Vendors: Agere Systems, Avaya, Buffalo Technology, Cisco, D-Link, Enterasys, Linksys, Netgear, Proxim and Symbol Technologies.

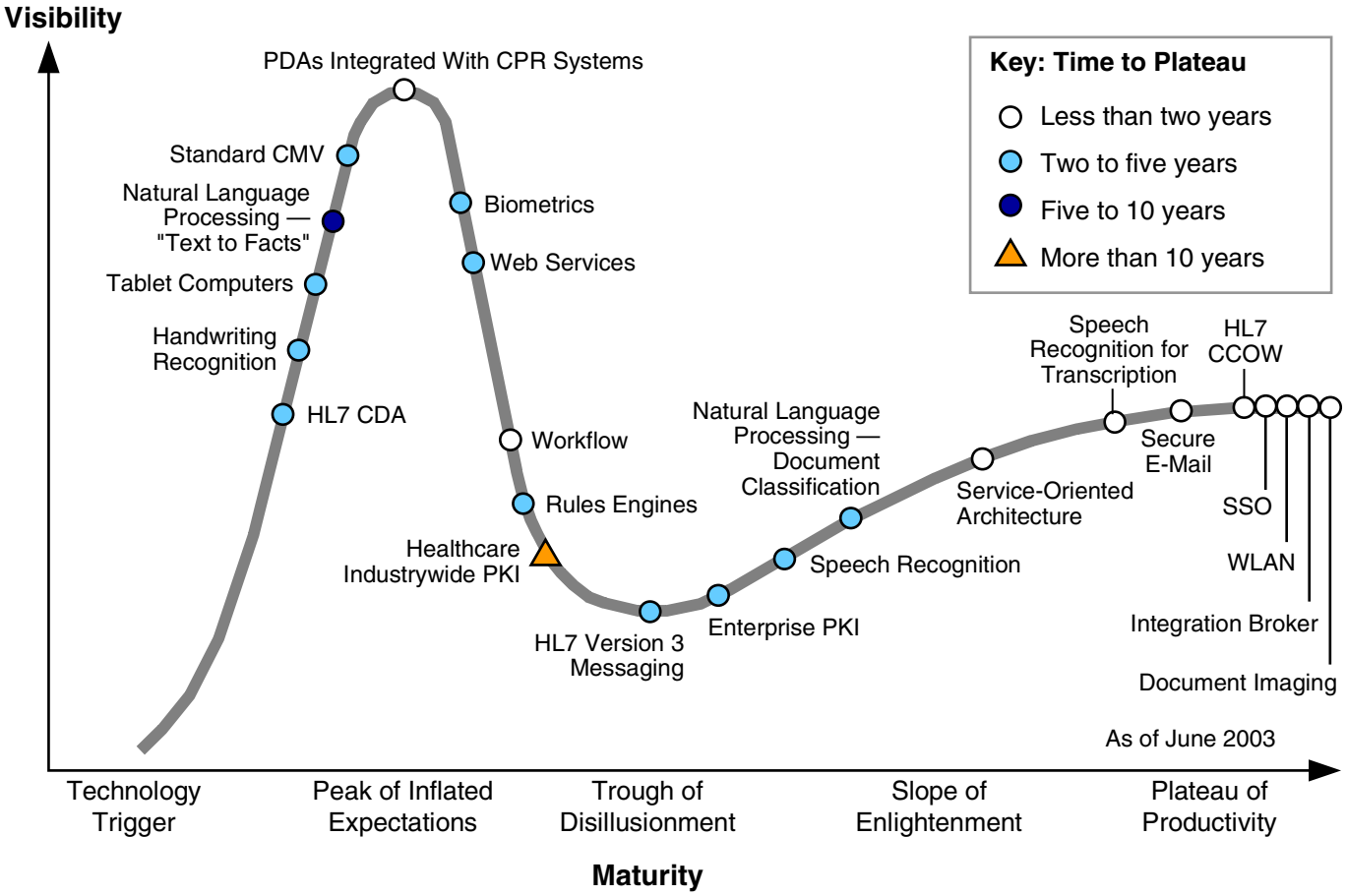
Analysis by Jim Klein

6.0 Conclusions

Care delivery organizations face a series of complex decisions regarding CPR systems. First, they must they choose a product. Later, they must decide which features to implement and where in the organization, and then they must be advocates to their vendors on how to expand functionality. There are many facets to these decisions, including functional, economic and technological ones. The technological decisions are confounded by the disconnection between the excitement about a technology and it becoming practical and reliable. Gartner's Hype Cycle for Healthcare Provider Technologies helps to clear this confusion. Care delivery organizations addressing these issues should follow two principals:

- **When evaluating the technologies in CPR systems, select strategically.** Thoroughly understand prospective vendors' vision with respect to the technologies in Gartner's Hype Cycle.
- **Implement new technologies tactically.** For technologies on the slope or near the plateau, look for technologies that are fully fleshed out and easy to implement. For less-mature technologies, look to see that the vendors understand their value and have a plan for implementing them, but only decide on early implementation if your company can tolerate the risk of being an early adopter.

Appendix A: Hype Cycle for Healthcare Provider Technologies, 2003



Acronym Key

CCOW	Clinical Context Object Workgroup
CDA	Clinical Document Architecture
CMV	controlled medical vocabulary
CPR	computer-based patient record
HL7	Health Level 7
PDA	personal digital assistant
PKI	public-key infrastructure
SSO	single sign-on
WLAN	wireless LAN

Source: Gartner Research (June 2003)

Figure 2. Hype Cycle for Healthcare Provider Technologies, 2003

Appendix B: Hype Cycle Phase Definitions

Technology Trigger: A breakthrough, public demonstration, product launch or other event generates significant press and industry interest.

Peak of Inflated Expectations: During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.

Trough of Disillusionment: Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.

Slope of Enlightenment: Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial, off-the-shelf methodologies and tools ease the development process.

Plateau of Productivity: The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. The final height of the plateau varies according to whether the technology is broadly applicable or benefits only a niche market. Approximately 30 percent of the technology's target audience have adopted or are adopting the technology as it enters the Plateau.

Time to Plateau/Adoption Speed: The time required for the technology to reach the Plateau of Productivity.

Appendix C: Benefit Rating and Maturity Level Definitions

Benefit Rating	Definition
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical applications that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental, but significant, improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings

Source: Gartner Research (June 2004)

Figure 3. Benefit Ratings

Maturity Level	Status	Products/Vendors
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out of box Methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner Research (June 2004)

Figure 4. Maturity Levels

Appendix D: Acronym Key

CCOW	clinical context object workgroup
CCR	continuity of care record
CDA	clinical document architecture
CMV	controlled medical vocabulary
CPR	computer-based patient record
EDI	electronic data interchange
HIPPA	Health Insurance Portability and Accountability Act
HL7	Health Level Seven
J2EE	Java 2 Platform, Enterprise Edition
PDA	personal digital assistant
PKI	public-key infrastructure
R1	release 1
R2	release 2
SNOMED-CT	Systemized Nomenclature of Human and Veterinary Medicine-Clinical Terminology
SOBA	service-oriented business application
SOIA	service-oriented integration architecture
RTE	real-time enterprise